

REMARKS

Claims 1-36, all the claims pending in the application, stand rejected on prior art grounds. Claims 30-36 stand rejected under 35 U.S.C. §101. Claims 22-28 and the Abstract are objected to because of informalities. The Abstract and Claims 22-28 are amended to overcome the objections. However, the Applicants respectfully traverse the rejections based on the following discussion.

I. The 35 U.S.C. §101 Rejections

Claims 30-36 stand rejected under 35 U.S.C. §101 because the claimed invention is directed to non-statutory subject matter. The Applicants traverse this rejection. Amended independent claim 30 claims "a program storage device readable by a computer and tangibly embodying a program of instructions executable by said computer in order to perform a method of testing integrated circuit devices after manufacture, said method comprising ...". Thus, claim 30 is a claim for an article of manufacture (i.e., the program storage device) that contains "functional descriptive material" (i.e., a program of instructions for performing...) and, is consequently statutory subject matter under 35 U.S.C. §101 (see MPEP§2106). That is, as stated in MPEP§2106, when functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits function of the descriptive material to be realized.

II. The Prior Art Rejections

Claims 1-36 stand rejected under 35 U.S.C. §102(b) as being anticipated by Debenham

(U.S. Patent No. 5,764,650). Applicants respectfully traverse these rejections because Debenham does not teach or suggest several of the patentable features of the present invention. Specifically, Debenham does not teach or suggest the feature in independent claim 1 of "retesting only devices in said failing group that have a type of defect approved for retesting" or the similar feature found in independent claims 8, 15, 22, 29 and 30. Debenham also does not teach or suggest the features in independent claim 8 or similar features in independent claims 15 and 29 of "retesting all said devices in said initial failing group to identify a retested passing group of devices that passed said retesting"; "analyzing said devices in said retested passing group to produce statistics regarding the likelihood that a failing device will pass said retesting according to said type of failure"; "evaluating said statistics to determine which types of failures have retest passing rates above a predetermined threshold to produce types a listing of types of defects approved for retesting"; and "testing an additional group of devices that is different from said initial group of devices to produce an additional failing group of devices that failed said testing of said additional groups".

More particularly, as described in the Abstract, Debenham teaches a system and method for testing one or more semiconductor devices (e.g. packaged chips). Test equipment performs at least tests of a first type on the semiconductor device and identifies failures in the semiconductor device, if any. A number of failures is determined. In the case where there are some failures, decision circuitry determines whether it is more efficient to repeat the tests or repair the semiconductor device, if it is repairable. The semiconductor device may be binned differently depending on the number of identified failures. The decision circuitry may designate the semiconductor device for an additional procedure, if the number of the identified failures is

within a first number set. The decision circuitry may designate the semiconductor device for repair, if the number of the identified failures is within a second number set. The decision circuitry designate the semiconductor device for additional tests of the first type, if the number of the identified failures is within a third number set. The tests of a first type may be a hot sort procedure and the additional tests may be a cold final procedure.

Contrarily, in the present invention, statistics are acquired during testing and retesting of an initial group of devices and, based on these statistics a listing of types of defects approved for retesting is determined. Then, following subsequent testing of different devices of the same type, retesting is performed only on those devices having a defect on the list. Thus, retesting of failed devices from additional groups that are tested, is based on the type of failures, not on the number of failures, as in Debenham. More specifically, as stated in the Abstract, the present invention is a method and system for testing integrated circuit devices, wherein an initial group of devices is tested to produce an initial failing group of devices that failed the testing. The devices in the initial failing group are identified by type of failure. Then, the devices in the initial failing group are retested to identify a retested passing group of devices that passed the retesting. Next, the devices in the retested passing group are analyzed to produce statistics regarding the likelihood that a failing device that failed the initial testing will pass the retesting according to the type of failure. Then, these statistics are evaluated to determine which types of failures have retest passing rates above a predetermined threshold. From this, a database is produced that includes an optimized retest table listing the types of defects that are approved for retesting. Then, an additional group of devices (that is different from the initial group) is tested,

but only those devices in the additional group that fail and have one of the defect types on the list are retested (e.g., see paragraphs [0034], [0035] and [0041]).

Thus, Debenham does not teach or suggest the following claimed features of the present invention.

A. "retesting only device in said failing group that have a type of defect approved for retesting" (see independent claim 1 or similar feature of independent claims 8, 15, 22, 29 and 30).

The Office Action cites step 122 in Figure 3 as disclosing this feature of the invention. The Applicants respectfully disagree. Specifically, referring to col. 8, lines 11-46, Debenham comprises a step 104 in which a semiconductor device is tested and this test involves determining the number of failures F. As explained in col. 8, lines 46-58, the purpose of determining the number of failures is that if the number is small, the failures tend to be actual failures and if there are actual failures, it is more efficient to repair the failure rather than to retest the device. Step 122 of Figure 3 is explained in detail at col. 8, line 46-col. 9, line 31. Specifically, this step 122 refers to a method step in which "If F [i.e., the number of failures in the device] is not less than X (i.e. F is within the third number set), then the semiconductor device may be retested...". Consequently, step 122 does not disclose retesting only devices in the failing group that have a type of defect approved for retesting, but rather retesting devices that have more than a specified number of failures.

B. "retesting all said devices in said initial failing group to identify a retested passing group of devices that passed said retesting" (see

amended independent claim 8 or similar feature of amended independent claims 15 and 29).

The Office Action cites step 122 in Figure 3 as disclosing this feature of the invention. The Applicants respectfully disagree. Specifically, as mentioned above, in step 104 of Debenham a semiconductor device is tested and this test involves determining **the number of** failures F. Debenham indicates that the purpose of determining the number of failures is that if the number is small, the failures tend to be actual failures and if there are actual failures, it is more efficient to repair the failure rather than to retest the device. Step 122 refers to a method step in which "If F [i.e., the number of failures in the device] is not less than X (i.e. F is within the third number set), then the semiconductor device may be retested...". Consequently, step 122 does not disclose retesting all of the devices in the initial failing group (see paragraph [0028] of the present invention) to identify a retested passing group of devices that passed the retesting, but rather retesting only those devices that have more than a specified number of failures.

C. "analyzing said devices in said retested passing group to produce statistics regarding the likelihood that a failing device will pass said retesting according to said type of failure" (see amended independent claim 8 or similar feature of amended independent claims 15 and 29).

The Office Action cites col. 7, lines 50-56 of Debenham as disclosing this feature of the invention. The Applicants respectfully disagree. Col. 7, lines 50-56 states that the system controller "analyzes the signal indicative of the number of failures and determines, **based on the number of failures**, whether to designate a semiconductor device for an additional procedure.

designate the semiconductor device for repair, or designate the semiconductor device for additional tests of the type previously received.” The cited portion of Debenham refers to the same feature, as described above, in which based on the number of failures exhibited by a semiconductor device during testing, the device is either repaired or retested. No where in the cited portion of Debenham does it disclose that devices that have passed retesting (i.e., devices in the retested passing group) are analyzed to produce statistics regarding the likelihood that a failing device will pass retesting according to the type of failure.

D. “evaluating said statistics to determine which types of failures have retest passing rates above a predetermined threshold to produce a listing of types of defects approved for retesting” (see amended independent claim 8 or similar feature of amended independent claims 15 and 29).

The Office Action cites col. 9, lines 23-30 as teaching this feature of the invention. The Applicants respectfully disagree. Col. 9, lines 23-30 refer to a method that may be used to determine the threshold number of failures F upon which the decision to either repair or retest is made. That is, tests are performed on numerous devices to create a record of the number of failures and then retesting the devices and creating a record of the number of failures determined in the retest. The number of failures in the retest is compared to the number of failures in the test to determine the threshold at which retesting is not economical. No where in the cited portion of Debenham does it disclose that statistics are evaluated to determine which types of failures have retest passing rates above a predetermined threshold in order to produce a listing of types of

defects approved for retesting.

E. “testing an additional group of devices that is different from said initial group of devices to produce an additional failing group of devices that failed said testing of said additional groups” (see amended independent claim 8 or similar feature of independent claims 15 and 29).

The Office Action cites step 104 as teaching both the feature of “testing an initial group of devices to produce an initial failing group of devices that failed said testing of said initial group, wherein said devices in said initial failing group are identified by type of failure” and teaching this feature of the invention. Claims 8, 15 and 29 have been amended herein to clarify that the additional group of devices is different from the initial group of devices. While “the additional group is different from the initial group” is not explicitly stated in the specification, this feature is implicit in the disclosure. That is, an “initial” group is clearly referring to a “first” group (see The American Heritage® Dictionary of the English Language, Fourth Edition, Copyright © 2000 by Houghton Mifflin Company) and an “additional” group is an “other” or “new” group (see Roget’s New Millennium™ Thesaurus, First Edition (v 1.3.1) Copyright © 2006 by Lexico Publishing Group, LLC.). Thus, the same feature of Debenham (i.e., step 104) can not be cited as teaching these two separate and distinguishable features of the present invention.

Therefore, independent claims 1, 8, 15, 22, 29 and 30 are patentable over Debenham. Further, dependent claims 2-7, 9-14, 16-21, 23-28, and 31-36 are similarly patentable, not only by virtue of their dependency from a patentable independent claim, but also by virtue of the

additional features of the invention they define. Moreover, the Applicants note that all claims are properly supported in the specification and accompanying drawings, and no new matter is being added. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections.

III. Formal Matters and Conclusion

With respect to the objections to claims 22-28 and the Abstract, claims 22-28 and the Abstract have been amended, above, to overcome these objections. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw these objections. Additionally, with respect to the rejections to the claims, the claims have been amended, above, to overcome these rejections. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw these rejections.

In view of the foregoing, Applicants submit that claims 1-36, all the claims presently pending in the application, are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary. Please charge any deficiencies and credit any overpayments to Attorney's Deposit Account Number 09-0456.

Respectfully submitted,



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